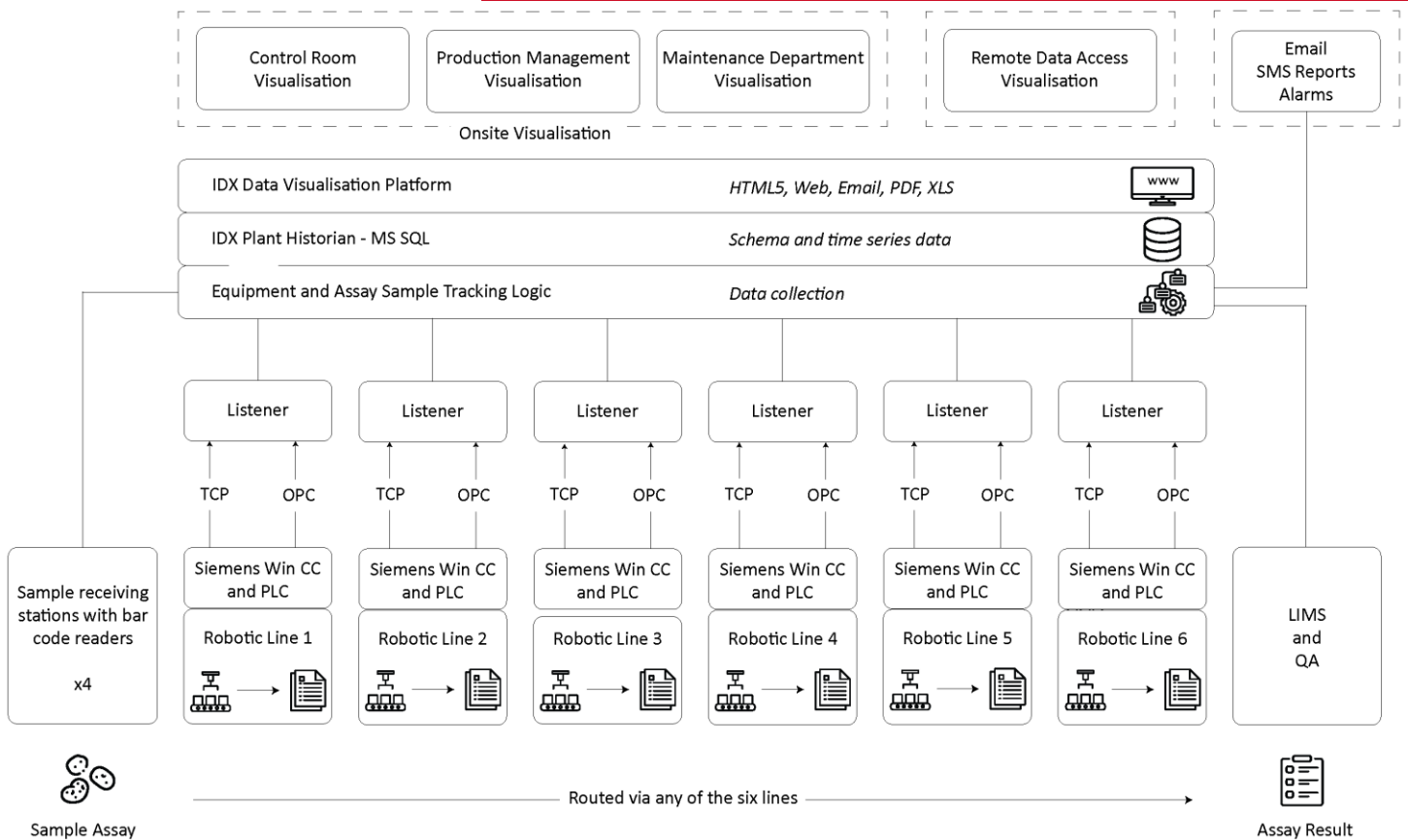


## CASE STUDY:

Maximising the throughput of a plant robotic laboratory through the effective use of historical process data



### Benefits:

- ✓ Operational insights
- ✓ Performance records
- ✓ Asset health monitoring
- ✓ Maintenance diagnostics

### Technology used:

- ✓ IDX Nexus Suite
- ✓ MS SQL Server
- ✓ .NET, HTML5

*The IDX Nexus Suite is a robust and versatile industrial communication hub that provides real-time data communications, data logging and alarm functions.*

*It is easily customised and so three major components were developed:*

- *IDX Robolab Interface*
- *IDX Plant Historian*
- *IDX Visualisation Platform*

## Performance Monitoring of a Robotic Laboratory

*Having access to the relevant process data for analysis and preventative maintenance is imperative for achieving the maximum possible throughput and availability of a plant while maintaining consistent quality. In this case study, we will discuss the solution that Industrial Data Xchange (IDX) provided to its client, to help them understand where in their process they were losing 50% of their expected throughput.*

### The challenge

The laboratory in question was operating at only 50% of its design capacity when the project was started. This discrepancy in expected throughput compared to actual throughput was attributed to interdependencies between equipment that had been installed after the original implementation. Regardless of the root cause it was agreed that process bottlenecks needed to be identified and addressed for throughput to be improved.

The process control software used provided inadequate data pertaining to breakdown and process events, as well as unstructured, incomplete, and insufficient real-time data. In addition to the process control software, a laboratory information management system was used, however, its primary focus was storage and distribution of assay and not performance monitoring.

Due to the lack of equipment performance data, successfully optimising the maintenance of the operation was not possible. And due to a lack of process-related data: monitoring key performance indicators for online operations, as well as performing data analysis and ad hoc investigations for the purpose of identifying where improvements could be made were not possible either.

## The solution

### The design and implementation of the Robolab Interface

The process control software used by the plant makes a vast number of process events, equipment alarms, and equipment statuses available via TCP messages and OPC. IDX was responsible for writing a custom module (Robolab TCP Listener) to capture the TCP data while OPC was already supported by IDX Nexus. Logic was developed to interpret and persist all required information that was made available by the process control software.

### The design and implementation of IDX Plant Historian

It was required that the data be persisted in a time series format, allowing it to be made accessible for maintenance as well as operational purposes by means of standard database query tools. The IDX Plant Historian makes use of MS SQL for data storage and user access.

All historical data stored was then used to improve the preventative maintenance effectiveness and operational efficiency. The availability of equipment status data and performance history trends such as mean time between failures, processing time per sample, and the number of samples processed aided in these improvements.

### The design and implementation of the IDX Visualisation Platform for process monitoring

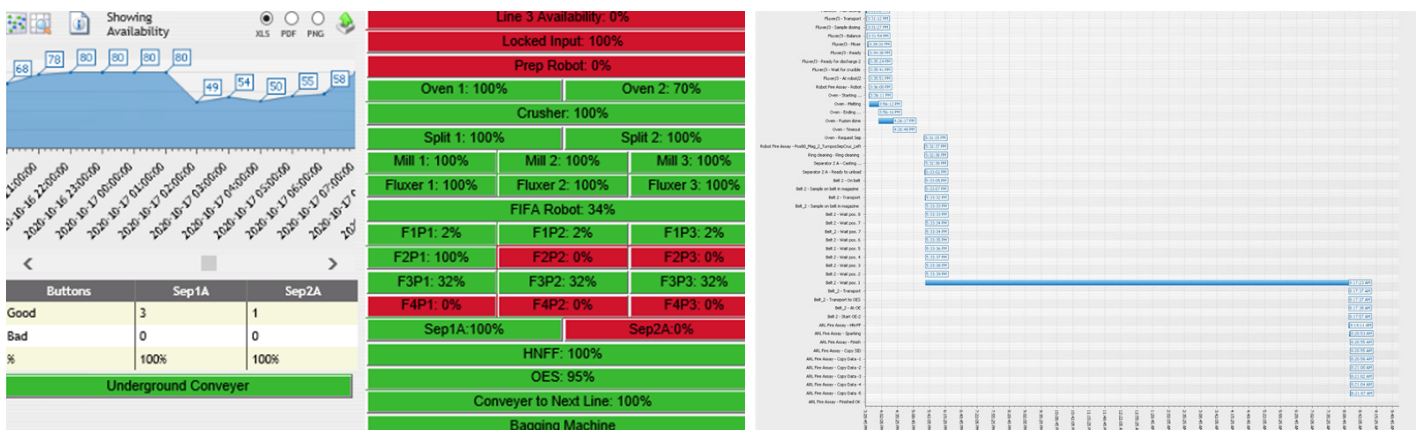
Using the data persisted in the IDX Plant Historian, the IDX Visualisation Platform was developed to allow for operational process monitoring. Effectively visualising the key performance indicators is imperative to optimise the use of available equipment.

Multiple views were created to target different audiences allowing people, to see the information relevant to their operations. These audiences include control room operators, sample loading operators, shift maintenance staff, and process overseers.

Two key performance contexts are provided:

- Equipment utilisation and performance - identify process bottlenecks
- Sample tracking - the route, and time duration at key process stages - from submission to result

Additionally, operators were given the ability to log operational events into the IDX Plant Historian. This enabled the alignment of process events with operational events, for a complete analysis of historical data.



Line availability view for equipment utilisation and performance

Sample tracking view

## Conclusion

Using real-time data collected and interpreted by the IDX Robolab Interface, the IDX Plant Historian in combination with the IDX Visualisation Platform provides clear insight of the Robotic Laboratory operations to all interested parties.

The views provided via the IDX Visualisation Platform provide an easy to use overview of the plant process in real-time, allowing the operators and other end-users to achieve their key performance indicators.

Finally, the utilisation of this detailed and relevant insight will support the continued improvement of the overall throughput of the plant process and system availability.